

Niagara

Memo 892
August 11, 1982
File: QU

Memo to: Planning and Development Committee
From: Planning Staff
Re: Niagara Sand and Gravel Production
Statistics Update

The purpose of this memo is to provide the Committee with current information on sand and gravel production in Niagara; its distribution throughout the Region; and estimated licensed reserves available to satisfy Niagara's future needs. Thus, this information updates part of the Niagara Sand and Gravel Study (NSGS) which was completed by the Planning and Development Department in April, 1981.

1. Sand and Gravel Production 1972-1981

Sand and gravel production in Niagara has declined significantly throughout the 1970's as Table 1 indicates. This trend is continuing in the early 1980's. Since 1979 for example, total sand and gravel production dropped by about 15% to 887,900 tons.

The Provincial picture, on the other hand, provides a contrast to Niagara. From 1972 to 1981, Ontario's production fluctuated. There was a considerable increase in the latter part of the 1970's whereas Niagara's production, over the same period, consistently decreased. Since 1979, however, Ontario's production has dropped quite significantly, (over 20%), to 82.5 million tons from 104.8 million tons.

2. Distribution of Sand and Gravel Production 1979-1981

Table 2 shows the distribution of licensed sand and gravel production including that from dredging. This information shows that although total production in Pelham declined by about 10% since 1979, it continued to stand out as the main source of sand and gravel accounting for about 84% of Niagara's total production. This area also contains the widest range of materials available in Niagara including fine aggregates used to make concrete sand.

The second largest source of sand and gravel is from sand dredging on the Niagara Bar located in Lake Ontario. In 1981 this source accounted for nearly 12% of Niagara's production. Like the Ponthill Kame, it too contributed to the supply of fine aggregates such as concrete sand.

Table 1

Sand and Gravel Production 1972-81
(000's of tons)

Niagara Region			Ontario
	Production* from licensed pits under The Pits and Quarries Control Act, 1971	Production** from sand dredging on Lake Erie, Lake Ontario and the Niagara River	Total Production** (This includes land-based pits as well as dredging operations)
1972	2090.4	162.0	2252.4
1973	1710.4	350.8	2061.2
1974	1691.8	195.0	1886.8
1975	1093.6	167.6	1261.2
1976	1309.4	143.3	1452.7
1977	1016.3	78.8	1095.1
1978	1058.1	99.5	1157.6
1979	933.5	109.5	1043.0
1980	860.4**	104.4***	964.8
1981	782.7**	105.2***	887.9
Average Annual Production from 1972 - 1981	1254.7	151.6	1406.3
			83,688.7

Memo 892 - Page 2

Sources: * Regional Municipality of Niagara Survey of Aggregate Producers, 1980.
 ** Ministry of Natural Resources.
 *** Estimate provided by aggregate producer in spring of 1981 and 1982.

Table 2

Distribution of Sand and Gravel Production
Including Dredging in Niagara by Area Municipality - 1979, 1980, 1981

	Number of Operations			Total Production (in 000's of tons)			% of Total Production		
	1979	1980	1981	1979	1980	1981	1979	1980	1981
Land Based Pits									
I <u>Municipality</u>									
Pelham	3	3	3	*823.6	**748.1	**742.4	78.9%	77.5%	83.6%
Niagara Falls	4	3	2	* 78.2	** 62.6	** 32.6	7.5%	6.5%	3.7%
Fort Erie	1	1	-	* 22.5	** 40.4	** -	2.2%	4.2%	-
Port Colborne	1	1	1	* 9.2	** 9.3	** 7.7	0.9%	1.0%	0.9%
II Dredged Sands from Lake Ontario and the Niagara River	1	1	1	**109.5	***104.4	***105.2	10.5%	10.8%	11.8%
III Total	10	9	7	1043.0	964.8	887.9	100.0%	100.0%	100.0%

Memo 892 - Page 3

Source: * Regional Municipality of Niagara Survey of Aggregate Producers, 1980.

** Ministry of Natural Resources.

*** Estimate provided by aggregate producer in spring of 1981 and 1982.

Sand and gravel production in Niagara Falls (St. Davids), Port Colborne and Fort Erie has been steadily declining, contributing less than 5% of Niagara's total production in 1981. Material from these pits are mainly suitable only for fill in road and building construction although some of the materials particularly along the Lake Erie Shoreline can be used for asphalt construction and metal casting.

3. Consumption of Sand and Gravel

From 1975 to 1979 the average annual consumption of sand and gravel from all licensed sources in Niagara was 1,201,900 tons. From 1977 to 1981 this figure dropped by about 14% or 172,200 tons.

Niagara's production per capita has also continued to drop quite dramatically. In 1972 the production per capita was 6.5 tons. In 1979 it was 2.8 tons per capita and by 1981 it continued this downward trend to 2.4 tons.

4. Estimated Licensed Reserves

Table 3 provides data on estimated licensed reserves of sand and gravel in land-based pits as of December 31, 1981.

According to the records of the Ministry of Natural Resources a total of 1.64 million tons of sand and gravel left Niagara's licensed pits in 1980 and 1981 combined. Based on this production information, Niagara would appear to have licensed sand and gravel reserves ranging from 10.5 million to 12.5 million tons.

Table 3 also shows the distribution of these reserves by area municipality. St. Davids is purported to have between 60% and 75% of the estimated licensed reserve. While the Ministry of Natural Resources is currently assessing the deposits in this area, they suspect that these reserves may only be suitable primarily for back-fill, and perhaps for some low quality granular products. The production of concrete sand appears less likely.

Fonthill, on the other hand, is estimated to contain less than 40% of the land-based reserves but contains the wider range of materials for products such as concrete sand.

The estimated 10.5 million to 12.5 million tons noted above do not include any sand dredging reserves. Although more work needs to be done concerning the quality and quantity of these deposits, one U.S. study (1970) estimates that there may be between 120 million to 180 million tons of sand and gravel in the Niagara Bar deposit alone. Furthermore, the Province of Ontario has recently expressed some interest in looking more closely at deposits in the lower Great Lakes and their potential for providing construction-grade aggregates.

Table 3
Estimated Licensed Reserves of
Sand and Gravel
(in 000's of tons)

Area	1979*	1981**
Pelham	4,000.0 - 6,000.0	2,509.5 - 4,509.5
Niagara Falls (St. Davids area)	± 8,000.0	± 7,904.8
Fort Erie Port Colborne	130.0	72.6
Dredging from Lake Ontario and the Niagara River	Tonnage unknown but a +25 year supply is estimated by the producer	-
Total	12,130.0 - 14,130.0 (plus undetermined sand dredging reserves)	10,486.9 - 12,486.9 (plus undetermined sand dredging reserves)

Source: * Ministry of Natural Resources, 1980 and Regional
Municipality of Niagara Survey of Aggregate Producers, 1980.

** Regional Niagara Planning and Development Department
estimate based on 1980 and 1981 actual production levels.

5. Life Expectancy of Resources
for Fine Aggregate in Niagara

Given that reserves in licensed land-based sources are limited, then it is clear that Niagara has a need for more sand and gravel. Currently licensed reserves in Pelham may not be expected to satisfy Niagara's longer term requirements.

The NSGS estimated that the total cumulative demand between 1981 and 1996 may be about 14 million tons. This represents 875,000 tons annually on average. From this amount 11.5 million tons may be required to enable the production of concrete sand. This is based on the assumption that not all the material extracted can be processed into concrete sand.

Table 4 shows some possible pit sources which may be available to supply Niagara's future needs particularly for fine aggregates. The amounts available from each source (the reserve) also are translated into life expectancy figures for the production of concrete sand. Possible additional supplies including dredging and manufactured sand from quarries, may continue to moderate Niagara's demand for sand and gravel in the future.

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Table 4

**Life Expectancy of Resource for Fine Aggregate
In Niagara (December, 1981)**

	Estimated Tonnage (000,000's)	Life Expectancy* (years)	Cumulative Number of Years of Supply
A. <u>Within Licensed Reserves</u>			
a) Pelham	2.5 - 4.5	3 - 6	3 - 6
B. <u>Potential Sources in Pelham**</u>			
a) T.C.G. 60 acre expansion in Possible Aggregate Area	6.8	9	12 - 15
d) D.L. Stephens' 14 acre expansion	1 - 1.5	} 2 - 4 }	} 14 - 19 }
c) Steed & Evans' 10 acre severance	1.0		
d) Steed & Evans' 125 acre proposed pit	9.6	13	27 - 32
TOTAL	20.9 - 23.4		
C. <u>Other Sources</u>			
a) Other Land-Based Pits***	?		
b) Dredging	?		
c) Manufactured Sand From Quarries	?		

* Assumed annual production of about 700,000 tons of aggregate to produce the required fine aggregate.

** Sources for which there has been, or there may be, an application to permit extraction.

*** Includes both St. Davids and Lake Erie shoreline pits.